Solar Pump Low Flow Rate

Causes, Fixes & Troubleshooting Guide

Pumps Africa Technical Support PDF

Solar Pump Low Flow Rate? Here’s What You Need to Know

A solar pump system may still run while producing very little water. In some cases, the flow slowly decreases over time. In others, the pump suddenly loses pressure and struggles to maintain output during the day.

Low flow rate problems are common in:

- Solar borehole systems
- Irrigation installations
- Livestock watering systems
- Off-grid water systems
- Agricultural pumping applications

Fortunately, reduced flow does not always mean the pump has failed completely. Often, the issue is related to:

- Insufficient solar power
- Low borehole recovery
- Blocked components
- Voltage problems
- Incorrect system sizing

This guide explains:

- Why solar pumps lose flow
- Common causes of low water output
- How to troubleshoot the problem
- Possible repair solutions
- When to contact a solar pump specialist

Whether you use a solar borehole pump for irrigation, domestic supply, or agricultural applications, these troubleshooting steps can help identify the issue quickly.

Because nothing causes instant panic quite like a borehole system suddenly producing the water pressure of a tired garden hose.

Common Signs of Low Solar Pump Flow

Your solar pump may:

- Produce weak water pressure
- Deliver less water than normal
- Run intermittently
- Stop during cloudy weather
- Lose pressure during peak demand
- Struggle to fill tanks
- Pump unevenly throughout the day

Additionally, the pump may still appear operational even though water delivery is poor.

---

1. Insufficient Sunlight or Solar Power

One of the most common causes of low solar pump flow is reduced solar power input.

Solar pumps rely entirely on adequate solar energy to operate efficiently. Therefore, if panel output drops, water flow also decreases.

Common Causes

- Cloudy weather
- Dirty solar panels
- Partial shading
- Incorrect panel angle
- Damaged panels

Common Symptoms

- Reduced flow during cloudy conditions
- Pump starts late in the morning
- Better performance at midday
- Uneven water delivery

Solution

- Clean solar panels regularly
- Remove shading where possible
- Inspect panel condition
- Verify correct panel orientation

Even small amounts of dirt or shading can reduce system performance significantly.

Solar panels can produce electricity from sunlight across millions of kilometers… yet somehow lose emotional stability because of one dusty bird footprint.

---

2. Low Borehole Water Level

If the borehole water level drops, the pump may struggle to maintain normal flow.

This commonly occurs during:

- Drought conditions
- Heavy irrigation demand
- Seasonal water shortages
- Poor borehole recovery

Common Symptoms

- Flow decreases during the day
- Pump cycles on and off
- Water output becomes inconsistent

Solution

- Monitor borehole recovery rate
- Reduce pumping demand
- Install water storage tanks
- Allow recovery periods

Low borehole yield is one of the most common causes of reduced solar pump performance in South Africa.

---

3. Blocked Pump or Pipework

Blocked components can restrict water flow significantly.

Common restrictions include:

- Sand buildup
- Dirty filters
- Scale deposits
- Debris in pipework
- Clogged strainers

As a result, the pump works harder while delivering less water.

Solution

- Inspect filters and strainers
- Flush pipework
- Remove debris
- Clean blocked components

Regular maintenance helps prevent recurring flow problems.

---

4. Incorrect Solar Pump Sizing

An undersized solar pumping system may struggle to meet water demand.

This often happens when:

- Irrigation demand increases
- Additional outlets are added
- Storage requirements grow
- The original design was incorrect

Common Symptoms

- Low pressure during peak usage
- Inadequate irrigation coverage
- Slow tank filling

Solution

- Review system requirements
- Verify pump sizing
- Upgrade solar array if necessary
- Check pipe sizing

Incorrect sizing is extremely common in low-cost installations where optimism replaced hydraulic calculations.

---

5. Voltage Drop or Electrical Losses

Voltage drop can reduce pump performance dramatically, especially on long cable runs.

Common causes include:

- Undersized cables
- Loose connections
- Damaged wiring
- Poor electrical joints

Symptoms

- Reduced pump speed
- Intermittent operation
- Low water pressure
- Controller warnings

Solution

- Inspect wiring connections
- Check cable sizing
- Measure voltage at the controller
- Replace damaged cables

---

6. Worn Pump Impeller

Over time, impellers can wear down due to:

- Sand abrasion
- Corrosion
- Cavitation
- Dirty water

As the impeller wears, pump efficiency decreases and flow drops.

Common Symptoms

- Gradual reduction in water flow
- Reduced pressure
- Increased noise

Solution

- Inspect impeller condition
- Replace worn components
- Check for abrasive water conditions

---

7. Air Leaks in the System

Air entering the suction line can reduce pump efficiency and water flow.

This often happens due to:

- Loose fittings
- Damaged seals
- Cracked suction pipes
- Poor priming

Solution

- Tighten fittings
- Replace damaged seals
- Inspect suction pipework

- Reprime the system

Even a small air leak can cause major performance problems.

---

8. Faulty Controller Settings

Incorrect controller programming can limit pump output.

This may happen after:

- Power interruptions
- Parameter resets
- System modifications
- Incorrect installation

Solution

Verify:

- Pressure settings
- Operating parameters
- Voltage thresholds
- Flow control settings

How to Troubleshoot a Solar Pump With Low Flow

Step 1 – Check Solar Panel Performance

Inspect:

- Sunlight conditions
- Dirt buildup
- Shading
- Panel voltage output

Step 2 – Verify Borehole Water Levels

Ensure:

- Adequate water availability
- Stable recovery rates
- No dry-run conditions

Step 3 – Inspect Filters and Pipework

Check for:

- Blocked strainers
- Dirt buildup
- Scale deposits
- Restricted flow

Step 4 – Inspect Electrical Connections

Verify:

- Cable condition
- Voltage readings
- Connector integrity
- Controller operation

Step 5 – Check Pump Components

Inspect:

- Impeller wear
- Pump condition
- Abnormal noise
- Flow consistency

Can Low Flow Damage a Solar Pump?

Yes.

If the pump operates under poor flow conditions for long periods:

- Overheating may occur
- Dry running can develop
- Pump wear increases
- Motor lifespan decreases

Therefore, reduced flow problems should always be investigated early.

When to Contact a Solar Pump Specialist

You should contact a technician if:

- Flow remains low after cleaning the system
- The borehole recovery rate is poor
- Controller warnings continue
- The pump overheats
- Voltage problems persist
- Water pressure drops suddenly

Solar Pump Troubleshooting & Repairs in South Africa

At Pumps Africa, we assist customers across South Africa with:

- Solar pump troubleshooting
- Borehole flow problems
- Irrigation system support
- Solar controller faults
- Water pressure issues
- Solar pumping system upgrades
- Off-grid water solutions

We supply:

- Solar borehole pumps
- Solar irrigation pumps
- Pressure systems
- Pump controllers
- Water storage systems
- Agricultural pumping solutions

Related Pump Troubleshooting Guides

You may also find these guides useful:

- Solar Pump Not Starting
- Pump Losing Prime
- Pump Overheating
- Borehole Pump Running Dry
- Low Water Pressure Problems
- Pump Vibrating Excessively

Need Help With Low Solar Pump Flow?

If your solar pump is producing weak water flow or low pressure, contact Pumps Africa for expert troubleshooting support and solar pump repair assistance across South Africa.

Our technical team can help diagnose:

- Low solar power problems
- Borehole recovery issues
- Blocked pipework
- Controller faults
- Voltage losses
- Pump sizing problems

Website: https://pumpsafrica.co.za

Because solar pump flow problems always appear at the exact moment somebody says: “The tanks should definitely be full by now.”